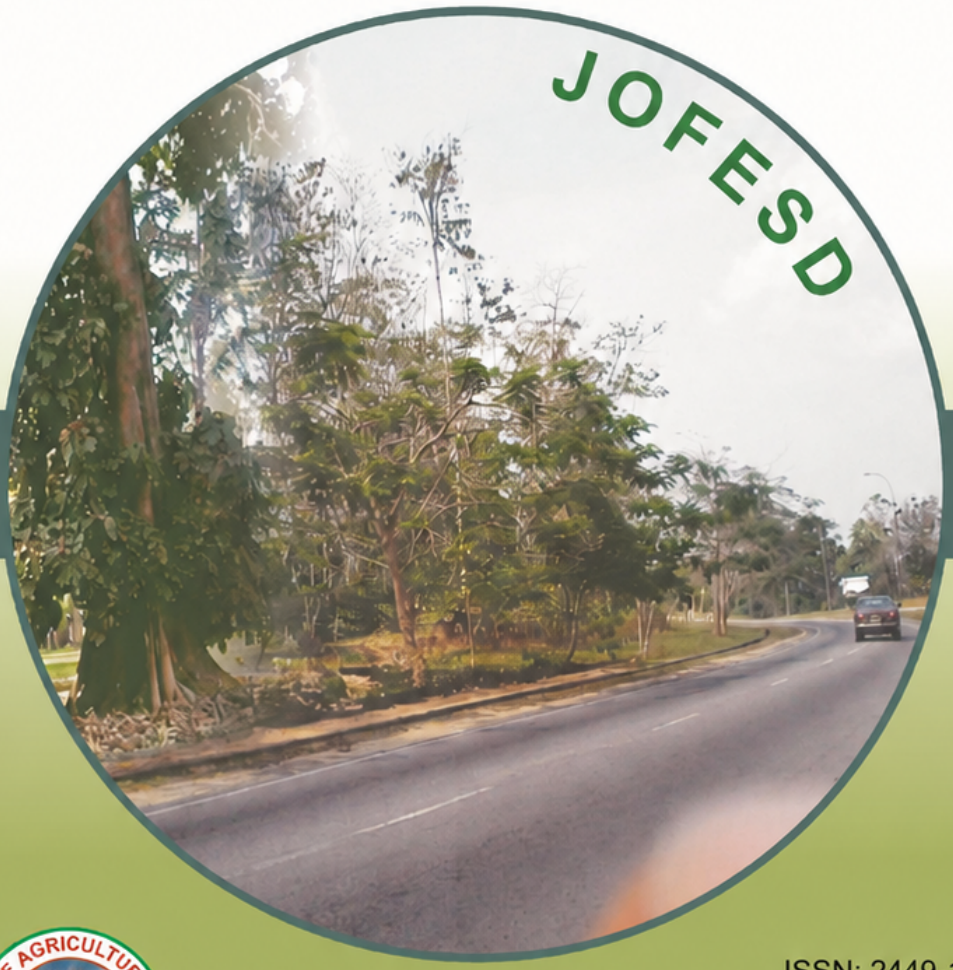
JOURNAL OF FORESTRY, ENVIRONMENT AND SUSTAINABLE DEVELOPMENT



ISSN: 2449-1845

Volume 7 Number 1 (March) 2021

Published by
DEPARTMENT OF FORESTRY AND NATURAL ENVIRONMENTAL MANAGEMENT
FACULTY OF AGRICULTURE
UNIVERSITY OF UYO
www.uniuyo.edu.ng (Journal, Department)

UNIVERSITY OF UYO, UYO
DEPARTMENT OF FORESTRY AND NATURAL ENVIRONMENTAL MANAGEMENT

JOURNAL OF FORESTRY, ENVIRONMENT AND SUSTAINABLE DEVELOPMENT (JOFESD).

Editorial Advisers

Prof. Prof. Enefiok S. Udo	-	University of Uyo, Nigeria
Labode Popoola		University of Ibadan, Ibadan, Nigeria
Prof. Emmanuel I. Inah	-	University of Ibadan, Ibadan, Nigeria.
Prof. Pius O. Egwumah	-	University of Agriculture, Markurdi, Nigeria.
Prof. Luca M. Luiselli	-	Institute Demetra, via Olona, Rome, Italy.

Editorial Board

Editor-in-Chief	Prof. Michael Akpan
Editor	Prof. Samuel I. Udofia
Assistant Editor	Dr. Opeyemi Olajide
Managing Editor	Dr. Egor B. Etigale
Associate Editors	Prof. Edem A. Eniang
	Dr. (Mrs.) Mercy P. Akpan
	Dr. E. E. Ukpong
	Dr. I. M. Etuk
Editorial Assistants	Dr. Kufre E. Okon
	Dr. D. E. Jacob

JOURNAL OF FORESTRY ENVIRONMENT AND SUSTAINABLE DEVELOPMENT (JOFESD)

Volume : Vol 7(1)
Published Date : March 1st, 2021

Table of Content

S/N	Manuscript Title	Pages
1	SURVEY OF HELMINTH PARASITES OF FRESHWATER FISH OF RIVER ETHIOPE, DELTA STATE, NIGERIA A.E Odiko || CORRESPONDING AUTHOR E.B. Okafor || CO AUTHOR	1-10
2	GROWTH RESPONSE OF RICE (Oryza Sativa L.) VARIETIES TO N-FERTILIZER MANAGEMENT AT KADAWA, SUDAN SAVANNA OF NIGERIA M Yahqub || CORRESPONDING AUTHOR	11-20
3	ALLOMETRIC EQUATION FOR ESTIMATING STEM BIOMASS OF Rhizophora SPECIES IN CROSS RIVER STATE MANGROVE FOREST, NIGERIA. E. B. Etigale || CORRESPONDING AUTHOR O. S Oke || CO AUTHOR V. A. J Adekunle || CO AUTHOR S. O Akindele || CO AUTHOR	21-38
4	POTTING SURVIVAL OF MARCOTS OF CACAO ((Theobroma Cacao L.) VARIETIES UNDER SELECTED HORMONES AND MIST CONDITIONS A. D Jibrin || CORRESPONDING AUTHOR M. M Pablito || CO AUTHOR	39-49
5	PROXIMATE COMPOSITION OF BLUE CRAB (Callinectes Sapidus) FROM ESCRAVOS RIVER, NIGER DELTA, NIGERIA A. E Odiko || CORRESPONDING AUTHOR C.C Maduakonam || CO AUTHOR	50-57
6	METAL FLUXES IN SOILS AND FOOD CROPS IN STONE QUARRY SITES OF UMUNNEOCHI COMMUNITY OF ABIA STATE, SOUTHEAST NIGERIA M. C Onyema || CORRESPONDING AUTHOR C. T Egbuche || CO AUTHOR I. K Gideon || CO AUTHOR R. E Ubaekwe || CO AUTHOR U. E Ekwugha || CO AUTHOR S. E Umeh || CO AUTHOR	58-66
7	EVALUATION OF STORAGE METHODS AND TEMPERATURE REGIMES FOR THE PRESERVATION OF Cola Lepidota K. SCHUM FRUIT H. O Okonkwo || CORRESPONDING AUTHOR A Olubunmi-Koyejo || CO AUTHOR U. F Akpan || CO AUTHOR	67-71
8	AN EMPIRICAL REVIEW OF FISH VALUE CHAIN IN NORTH-EAST NIGERIA I.I Omorogbe || CORRESPONDING AUTHOR S.O Alakpa || CO AUTHOR	72-78
9	STAND POPULATION ANALYSIS AND REGENERATION POTENTIALS OF TREE SPECIES IN FABACEAE FAMILY IN OBAN FOREST RESERVE, CROSS RIVER STATE, NIGERIA O Olajide || CORRESPONDING AUTHOR E. B Etigale || CO AUTHOR	79-86
10	EFFECTS OF GOLD MINING ON LIVELIHOOD OF TREE CROP FARMERS IN ATAKUMOSA WEST LOCAL GOVERNMENT AREA, OSUN STATE, NIGERIA O. K Akintunde || CORRESPONDING AUTHOR T.O Agboola || CO AUTHOR O. L Balogun || CO AUTHOR D.E Olorede || CO AUTHOR A.A Alabi || CO AUTHOR	87-94
11	WOOD SPECIES UTILIZED BY SMALL SCALE FURNITURE MAKERS: A CASE STUDY OF UMUAHIA TIMBER MARKET, ABIA STATE. O. D Chukwuemeka || CORRESPONDING AUTHOR M.U Chikwendu || CO AUTHOR F.N Nkem || CO AUTHOR	95-101

© 2017-2026 Erudite Scholars

12	HOUSEHOLDS' VULNERABILITY AND LIVELIHOOD DIVERSIFICATION IN THE CHANGING STATE OF CLIMATE AND ENVIRONMENT AMONG FISHER FOLKS IN A COASTAL COMMUNITIES IN NIGER DELTA REGION, NIGERIA Okon Williams Williams || CORRESPONDING AUTHOR Samuel Awolumate || CO AUTHOR	102-110
13	ASSESSMENT OF IMPLEMENTATION OF RURAL DEVELOPMENT PROJECTS THROUGH COMMUNITY DEVELOPMENT ASSOCIATION (CDA) IN APETE COMMUNITY, IBADAN, NIGERIA U. C Osu || CORRESPONDING AUTHOR S Yakubu || CO AUTHOR	111-118
14	CONSTRAINTS AND PROSPECTS OF URBAN SPRAWL AND SQUATTER SETTLEMENT IN PORT-HARCOURT: AN EMPERICAL ANALYSIS A. M Imikan || CORRESPONDING AUTHOR N. C Ekong || CO AUTHOR	119-126
15	EFFECTS OF Gmelina Arborea AND Elaesis Guineensis ON THE PHYSICAL AND CHEMICAL PROPERTIES OF SOIL IN UYO SOUTH EASTERN NIGERIA U.O Peter || CORRESPONDING AUTHOR G.N Essien || CO AUTHOR N.G Ekanem || CO AUTHOR	127-135

HOUSEHOLDS' VULNERABILITY AND LIVELIHOOD DIVERSIFICATION IN THE CHANGING STATE OF CLIMATE AND ENVIRONMENT AMONG FISHER FOLKS IN A COASTAL COMMUNITIES IN NIGER DELTA REGION, NIGERIA

***Samuel Awolumate and **William Okon Williams[1]**
*Department of Fisheries and Animal Sciences, Faculty of Agriculture
National Open University of Nigeria, Kaduna Campus, Kaduna State, Nigeria
**Department of Sociology, Faculty of Social Sciences, University of Calabar, Calabar, Cross River State, Nigeria.
[1]Correspondence Author: williamokon4good@gmail.com

ABSTRACT

The multi-dimensional consequences of climate variability, oil spills, and social instability have influenced the pattern of involvement in livelihoods in the oil-producing region in Nigeria. This study adopted a rural participatory appraisal approach to evaluate the impact of climate and environmental change, oil spills, and the psychosocial situation on the sources of livelihoods of households in the coastal communities of the Eastern Obolo region in rural Akwa Ibom State, Nigeria. The study examined the various dynamics of households' livelihood involvements, characterized the poverty profile based on background characteristics in order to estimate households' vulnerability to risk and uncertainty, investigated the influence of dimensions of livelihood on the welfare of the dwellers, and make policy recommendations based on the findings of the study. A multistage sampling technique was used to elicit data from 200 respondents. Many analytical techniques were employed, including Foster, Greer, and Thorbecke (FGT 1984) weighted poverty measure and the descriptive statistics. Findings revealed that the majority of the household heads (93%) were less than 62years old. Welfare and poverty decomposition indicates a very deplorable situation for the region. There is evidence of a shift from traditional occupation (fishing) and related activities to gathering and processing non-agro-related economic activities.

Keywords: Livelihood diversification, Environmental vulnerability, poverty, Niger Delta.

INTRODUCTION

Keeping pace with the growth in population and food production in most sub-Saharan African countries has been quite challenging. Threats of food insecurity and inadequacies of basic human welfare across the regions are due to the influence of prevailing and risky environmental conditions (Okon, Frank, Etowa, and Nkeme (2017) and Shaibu, Abdullahi, Ango, Yusuf, Suilaiman, and Bello (2015)). In Nigeria, the severity of these interactions between the environment and agricultural productivity varies spatially across its different agro-ecological zones Amos, Akpan, and Ogunjobi (2014). Ensuring food sufficiency has been. It is still a matter of topmost focus in the National Development Plans since independence, Amos, Akpan and Ogunjobi (2014) and Boko, Niang, Nyong, Vogel, Githeko, Medany, Osman-Elasha, Tabo and Yanda (2007). The scientific responsiveness or preparedness of the Nigerian Agricultural Systems to the emerging threats of health pandemics and environmental change to food and human security is debatable (Oladipo, 2010, Chamber, 2009 and Cattermoul, Brown and Poulain, 2012). Climate change is inevitable and calls for a deep understanding of the status quo on how it has influenced the livelihoods of the rural regions in Nigeria, particularly the Niger Delta region or the coastal

communities, Leviene, Ludi and Jones (2011) and Laddey, Kumamoto and Treichel (2011). Niger Delta region of Nigeria has major fishing communities, which attracts diverse ethnic nationalities to engage in different livelihoods (Oladipo,2010). Within the context of the unfolding changing state of the climate and environment, its direct and indirect effects affect the fish production resources and food and livelihood security, FAO (2016). Household vulnerability generally describes the expected loss in the welfare of household members due to shocks and other contingencies, Günther and Harttgen (2006). As the environment is changing, arrays of coping strategies and adjustments have been employed by the dwellers, particularly in the Niger Delta region, IPCC (2007) Inyang, Eka, Udoma, and Okon (2004), Townsend (1994), and Udry (1995). Poverty and low quality of life had been documented about the region and how vulnerable the dwellers could be IPCC (2007), Owabukeruyele (2000), Ibaba (2002), Bassey (2003), and Onosade (2000) but how are they adapting in their circumstances? Antwi-Agyei, Dougill, Fraser and Stringer (2012), IPCC (2012), IPCC(2007) and SEI, IUCN, IISD, and Intercooperation (2003) admitted that climate-related changes to resource flows could affect livelihood security, particularly among the poor.

Furthermore, they advocated for a deep understanding of what makes fisher folks vulnerable to events and factors that lead to poverty and make livelihood improvement difficult. Several authors like Ifeanyi-Obi and Iremesuk, 2018; Bunting,2004; Pérez-Sanchez, Muir and Ross, 2005; Ross and Martinez Palacios, 2004; Tien, Tuan, Phoung and Leschen, 2005 and Van Brakel, Morales, Danai, Turongruang and Little (2003) have focused on fishery and livelihoods. However, little has been done directly concerning climate change, poverty (vulnerability), and livelihoods. However, this focus becomes pertinent because of the apparent non-existing adaptive capacities of the virtual socially excluded dwellers of coastal communities in the Niger Delta region in Nigeria. Evidently, since 2008 the Nigeria food system has experienced some level of food crises and the resultant food price increment. As part of the coping strategy, the national government resolved to import some food to ameliorate the effects. Apart from the annual growth rate not keeping pace with the food production (World Bank, 1996), climate change and variability have been observed to correlate with the declining agricultural productivity in Nigeria. At the early stages, many reasons were attached to a socio-cultural and religious context, Kairi Consultant Limited (2013). presently, research positions have admitted that the effect of climate and environmental changes and uncertainties at the onset of the farming season has led to an unusual sequence of poor harvest and food shortages.

Similarly, in the lowland of this study area or Niger Delta region, the experiences of flooding and sea level rises have dealt hard blows on the livelihood and the assets of the dwellers (NEST, 2005 and Adejuwon, 2006). The impacts of climate change in the Niger Delta region of Nigeria are a cause for concern because of the peculiar nature of the significant oil exploitation belt environment in Nigeria. The influence of climate in this region has been driven and overshadowed by environmental issues induced by industrial and human activities. Indeed, how resilient the dwellers of these enclaves have been or will continue to cope in the changing face of climate and environment calls for scientific measurement and evaluation Adejuwon (2006).

MATERIALS AND METHODS

The survey cut across ten communities in Eastern Obolo, a core area in the Niger Delta region, Nigeria, located within latitude $4^{0}30^{1}$ North and between Longitude $7^{0}35^{1}$ and $7^{0}50^{1}$ East (Okoro and Inyang, 2008). The area lies in a tropical rainforest zone and has two major seasons: a rainy season (May to October) and a dry season (November to April). About 90% of the area is waterlogged, and the traditional occupation is fishing. A multistage sampling procedure was used to select 200 households where the head of the households responded to the survey instruments—descriptive statistics and FGT (1984) Index.

RESULTS AND DISCUSSION

Demographic Characteristics and Vulnerability Profile of the Households.

The Niger Delta region of Nigeria is affected by multifaceted factors driven by human-made and natural conditions. The stress effects have influenced some sources of economic earnings. They have led individuals to engage in different income-generating activities, which has changed the earlier perceived understanding of livelihood in some regions of the world. (Udo, Akpan and Uko (2017), Etuk and Odebode (2016), Udoh and nyienakuna (2008), Olawoye (2001) and Ijiff (1990)). Some households do not only depend on one source of finance but arrays of entrepreneurship due to the risks, uncertainty, or vulnerability to climatic change. This study focused on the seemingly, socially-excluded coastal communities, which were initially involved in fishing or related activities as a means of livelihood. Unarguably, the region's dwellers had been adjusting to their circumstances, but what is the status quo with regards to changing state of climate and environment on the prevalent livelihoods in the study area, and what is the degree of their vulnerability to further changes in climate and the environment? It, therefore, became pertinent to decompose the poverty status among the household to see how their wellbeing varies from one subgroup to another.

The result of the analysis of the study population's general wellbeing indicator reveals a mean per capita weekly household expenditure pattern of about ₦1021.04. Regarding the Foster, Greer, and Thorbecke 1984 index procedure to establish the poverty line, a relative poverty line of ₦680.69 was derived. Based on the poverty decomposition of the population, the incidence of poverty (Po) stood at 0.45, reflecting the proportion of people below the poverty line. The results hold much information to decision-makers and program planners to serve as a baseline for ascertaining or testing the effectiveness, over time, space, or subgroup, of policies intended to lessen the relative number of vulnerable people.

The analysis further revealed a poverty depth or gap of 0.16, giving an idea of the proportion of the poverty line required to lift vulnerable people out of poverty. The findings support Jaiyeola and Bayat, (2019) assertion that provision of necessary facilities for skill development, employment opportunities and access to soft loans or grants for entrepreneurial development and business start-ups will reduce the poverty level and gap"

Table 1 Demographic Characteristics and Vulnerability to Climate Profile

Item	Variables	Demographic characteristics (%) (n = 200)	Poverty Decomposition (n = (91)	
			Incidence (P_o=0.45)	Depth (P_1 = 0.16)
1	Age			
	30 - 39	39.5	0.13	0.3101
	40 – 49	31.5	0.17	0.3368
	50 - 59	19.5	0.11	0.4574
	60 – 69	9.5	0.45	0.2936
2	Marital status			
	Single	9.5	0.005	0.0206
	Married	75.0	0.365	0.3790
	Divorced	5.5	0.025	0.2655
	widowed	10.0	0.060	0.2862
3	Educational Status			
	Informal	46.0	0.240	0.4030
	Adult literacy	8.5	0.070	.04056
	Primary	29.0	0.120	0.2397
	Secondary	14.0	0.025	0.3354
	Tertiary	2.5	0.000	0.0000
4	Household size			
	1 – 3	57.0	0.245	0.3951
	4 – 6	37.5	0.185	0.3086
	7 – 10	5.5	0.025	0.3345
5	Primary Occupation			
	Fishing/Processing	51.0	0.205	0.3861
	Farming	6.0	0.040	0.4411
	Trading	12.5	0.035	0.1755
	Public service	3.0	0.005	0.0206
	Gathering non-aquatic Products	22.0	0.145	0.3506
	Artisanship	5.5	0.025	0.3566

With regards to the age of the household heads, it was grouped into four subgroups, and the majority of them (70%) were within the range of 30 to 49 years old and could be portrayed as a young adult, quite physically endowed to survive the economic and social demands the environment. The subgroup (30 – 39 years) categories made up 39.5% of the population, out of which about 13 percent were poor. The incidence of poverty was more (Po = 0.17) in the following category (40 to 49 years of age) but gradually reduced as age categories increased. The high incidence of poverty between 40 to 49 years could be because most people in this category are recently married and frequent with reproductive issues and provide basic needs to the extended families. The incidence of poverty among the higher subgroups reduced as age advances. The slight reduction could be attributed to more members of the family contributing to the upkeep of the household. Also, at this stage, the economic structures and social linkages of the adult members of the household become more effective. Households with later structure could resist or adjust to idiosyncratic and covariate shocks due to remittances from children and relatives from distant locations.

Regarding the poverty gap, the subgroup of 50 to 59 years, despite having a relatively low incidence of poverty (0.11), require a 45 percent improvement in the weekly expenditure to escape their current state of vulnerability to possible loss in their welfare. Apart from the latter subgroup, the rest of the subgroups require about 30 percent improvement in their consumption expenditure to live above the poverty line. Regarding Item 2 Table 1, married households are experiencing the highest

incidence of poverty (0.36) among 75 percent of the married population. In the study area, the divorced subgroup had a poverty incidence of 0.02 out of their 5.5 percent distribution. Similarly, married households require the highest expenditure, a 38 percent increment in their expenditure pattern to maintain a good living condition. Incidence of poverty was less prominent in single-headed households.

The status of educational attainments had some influence on the incidence of poverty across its respective subgroups. The result obtained from our study is consistent with the one conducted by Bonal, (2007). He stated that educational expansion the group of persons with higher education and high earnings increases and the educational level of the large labour force segment rises also but the former effect increases inequality (that causes poverty) and the later one does not.

The most significant incidence of poverty was felt by 80 percent of household heads who had less than six or six years of formal education. Correspondingly, Table 1, item 3 reveals a similar pattern in the index of additional welfare expenditure to stay above the poverty line. The distribution pattern of incidence and depth of poverty concerning item 4, Table 1 depicts an exciting pattern. The frequency of households decreased as the size of households increase. A similar trend was evident in the poverty incidence and gap against the household size. The state of the welfare of the larger household size could be time-related, and they gain from having a sizeable number of household members engage in rewarding endeavors. Despite the relative decrease in poverty incidence across the subgroups, virtually the same amount of improvement of more than 30 percent of per capita expenditure would be needed to reduce the degree of vulnerability of the households. Concerning Table 1, item 5, the incidence of poverty was more substantial among the households that depended primarily on ecosystem resources as the primary source of livelihood, unlike the non-ecosystem means of livelihood. Similarly, not less than 35 percent improvements on welfare consumption expenditure would be required of the subgroup, particularly the gatherers of non-aquatic products.

Dimensions of Livelihood Diversification among the Household

This subsection examines the prevalent economic activities considered a means of livelihood among the dwellers in the study area. The arrays of livelihood activities were disaggregated into an agro and non-agro-based livelihood. The analysis was made based on the degree of vulnerability of the respondent (indigent and non-poor) to loss of livelihood. As shown in Table 2, the response analyses suggest that virtually half of the population in both vulnerable subgroups were involved in multiple livelihood activities. However, more than half of the population across were all the sub-groupings. It was observed that both non-poor and poor engage in similar livelihoods trend, but there was a higher withdrawal from agro-based livelihoods than the poor. Generally, the respondents under the non-agro livelihoods find it convenient to operate more than one enterprise. Basically, the dweller were itinerant fishermen, and some were farmers, but they are slowly shifting towards non-agro related. This agreed with Omonona (2009) who noted multiple economic activities were common in the rural communities in Nigeria.

Table 2: Analysis of Livelihood Diversifications Among the Households

No of Livelihood Activities	Poor Sub-Group		Non-poor Sub Group	
	Agro (%)	Non-Agro (%)	Agro (%)	Non-agro (%)
None	15.4	5.5	17.4	5.5
One	56.0	35.2	56.9	45.9
Two	26.4	39.6	22.7	33.0
Three	2.2	16.5	1.8	10.1
Four	0.0	1.1	0.90	3.7
Five	0.0	1	0	1.8

CONCLUSION AND RECOMMENDATIONS:

The findings of this study, the socio-economic wellbeing of coastal communities, is flawed and is getting increasingly more impoverished. The environment is getting more exploited and polluted by oil spills on water and land under the unfolding state of climate variabilities and changes in the Niger Delta region of Nigeria. The climatic and environmental adaptations and resiliency capacity of rural dwellers in the fishing communities are virtually insufficient or nonexistent. Thus urgent intervention is needed to mitigate future risk and hazards. Like most health and socio-economic development programmes, which are educational, mitigation of the mid and long-term impacts of environmental and climate change should be educational across all the stakeholders. Therefore, issues for consideration towards developing adequate environmental and climate change adaptation capacity should critically address the following:

i. Need to measure the state of preparedness of local institutions and the agricultural systems for scientific intervention.
ii. Environmental and climate change-friendly vocational education should be designed for vulnerable people.
iii. Extension Agent – School Teacher - Younger generations oriented information communication technology strategic planning is essential for climate change awareness intervention.
iv. An electronic agricultural extension delivery system is critical.

REFERENCES

Adejuwon, J. (2006). "Food Security, Climate Variability and Climatic Change in Sub-saharan West Africa." A Final Report Submitted to Assessment of Impacts and Adaptations to Climate Change (AIACC), Project No AF23, Published by The International START Secretariat, USA.138pp.

Amos, E., Akpan, U., Ogunjobi, K. (2014) Households' perception and livelihood vulnerability to climate change in a coastal area of Akwa Ibom State, Nigeria. https://dx.doi.org/10.4314/jae.v22i1.6

Antwi-Agyei, P., Dougill, A. J., Fraser, E D. G., Stringer, L. C. (2012) Characterizing the nature of household vulnerability to climate variability: empirical evidence from two regions of Ghana

Bassey, N (2003) Oil and gas exploration and Exploitation in the Niger Delta: The Social and Demographic Challenges in Ojo, G. U(ed) Empowerment in Action: Environmental Rights Actions (ERA's) Community intervention in the Niger Delta: A model for Development, ERA, Benin City, Nigeria. Pp 47-64.

Bonal, X. (2007). On Global Absences: Reflections on the Failings in the Education and Poverty Relationship in Latin American Countries. International Journal of Educational Development, 27,86-100.

Bunting, S.W. (2004). Wastewater Aquaculture: Perpetuating Vulnerability or Opportunity to enhance poor livelihoods? Aquatic Resources, Culture and Development 1, 51 – 75.

Cattermole, D. Brown, & F. Poulain, eds. (2012). Fisheries and aquaculture emergency response guidance: Review recommendations for best practice, FAO Workshop, Rome.

Chambers, R. (2009). *Climate Vulnerability and Capacity Analysis*. Research Associate Institute of the Development Studies University of Sussex, UK. pp. 111-169.

Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change, In Field, C. B., Barros, V., Stocker, T. F., Qin, D., Dokken, D. J., Ebi, K. L., Mastrandrea, M.D., Mach, K. J., Plattner, G.-K., Allen, S. K., Tignor, M. &Midgley, P. M. (eds.). Cambridge, Cambridge University Press.

Etuk, E. E. and Odebode, S. O. (2016). Comparative Analysis Of Rural Households' Wellbeing In the Selected States Of The Niger Delta Zone Of Nigeria. *Nigerian Journal of Rural Sociology Vol. 16, No. 4*

FAO. (2016). *The State of World Fisheries and Aquaculture 2016*. Rome.

Foster, J. Greer, J and E. Thorbecke (1984). A class of Decomposable Poverty Measures 52;761-5

Günther, I and K. Harttgen (2006). Estimating Vulnerability to Covariate and Idiosyncratic Shocks. Nr. Ibero-America Institute for Economic Research (IAI). 39PP

Ibaba, S.I. (2002). Oil and Politics consciousness in the Niger Delta in Okoko, K. (ed). Nigeria Journal of Oil and politics, vol. 2, No1, Dikes Memories Books Ltd, Port Harcourt. Pp 79-90.

Ifeanyi-Obi, C.C., Iremesuk, P. (2018). Environmental Factors Influencing Artisanal Fishing in Eastern Obolo Local Government Area of Akwa Ibom State https://dx.doi.org/10.4314/jae.v22i1.6

Ijff, A. M. (1990). "Socio-economic Conditions in Nigerian Fishing Communities." Programme for Integrated Development of Artisanal Fisheries in West Africa, Cotonou. P119

Inyang, E.B., Eka, I.E., Udoma, G.M., Okon, O. (2004). Human Dimensions of Family and Farm Forestry. International Symposium on Livelihood and Insecurity.

IPCC (2007). Climate Change*: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, In* Parry, M. L., Canziani, O.F., Palutikof, J. P., Van Der Linden, P. J. & Hanson, C. E. (eds.). Cambridge, Cambridge University Press.

IPCC (2012). *Managing the Risks of Extreme Events and Disasters to Advance Climate.*

Jaiyeola, A. O., and Bayat, A. (2019). Assessment of trends in income poverty in Nigeria from 2010–2013: An analysis based on the Nigeria General Household Survey. Journal of Poverty, 24(3), 1–18.

Kairi Consultants Limited. (2013). "Climate change awareness, attitudes and behavioral practices in the OECS: a KAP survey of six member states." OECS Survey Report Volume 1 – Main Survey Report. Castries, Saint Lucia.

Laddey, R., Kumamoto, M. and Treichel, P. (2011). *African Adaptation Programme Experiences Gender and Climate Change: Advancing development through an integrated gender perspective*. UNDP, New York 1:16-67.

Levine, S., Ludi, E. and Jones, L. (2011). *Rethinking Support for Adaptive Capacity to Climate Change, the role of development interventions*. ODI, London, UK. 210pp.

NEST (2005) Multi-Sector Surveys on Nigeria's Vulnerability and Adaptation to Climate Change.

Okon, U.E., Frank, N.N., Etowa, E.B. and K. K. Nkeme. (2017). Household-level food security status and its determinants among rural farmers in Akwa Ibom State, Nigeria, *Agricultural Science Research Journal* Vol. 7(10): 297 – 303.

Okoro, G. I and E. B Inyang. (2008) Environmental Change and the Changing Pattern of Livelihood Activities in an Oil Exploitation Region, Nigeria. A paper presented at the 17th Annual Conference of the Nigerian Rural Sociological Association (NRSA), 19th and 22nd August Umudike, Abia State. 11pp

Oladipo, E. (2010). Towards Enhancing the Adaptive Capacity of Nigeria: A Review of the Country's the State of Preparedness For Climate Change AdaptationEvidence from Burkina Faso. *World Development*, 36, 625-640.

Olawoye, J. E (2001). Gender Informed Approaches to Sustainable Human Development. A paper presented at the training Program on Gender Issues in Economic Development at National Centre for Economic Management and Administration (NCEMA), Ibadan, 27th – 28th August. Pp.6-7

Omonona, B.T. (2009). Quantitative analysis of rural poverty in Nigeria, Nigeria Strategy Support Program (NSSP), NSSP Report 9, International Food Policy Research Institute, Washington DC. *(19) (PDF) Food Poverty and Livelihoods Issues in Rural Nigeria*. Available from: https://www.researchgate.net/publication/265358380_Food_Poverty_and_Livelihoods_Issues_in_Rural_Nigeria [accessed Apr 29 2021].

Onosade, G. (2000). Environmental Management and Sustainable development in the Niger delta in Osuntokun, A. (ed) Environmental Problems of the Niger Delta. Fridrich Ebert Foundation, Lagos, pp,11 -25.

Owabukeruyele, W.S (2000). Hydrocarbon Exploration, Environmental Degradation and Poverty in the Nigeria Delta Region of Nigeria, Lund, Sweden. Pp 1-3. www.waado.org/../environment/Petrolpolution/enveconomics.htm.

Pérez-Sanchez, E., J. Muir, and L. Ross, (2005). Livelihood Option for the Coastal zone of Tabasco, Mexico. Aquatic Resources, Culture, and development. 1, 91 – 108.

Ross, L.and C. Martinez Palacios, (2004). Towards culture Technology for Pescado Blanco, choristoma estor. *Aquaculture News*. Vol. 31, Pp. 2-3, 2004.

SEI, IUCN, IISD, and Intercooperation (2003). Livelihoods and Climate Change: combining disaster risk reduction, natural resource management, and climate change adaptation in a new approach to reducing vulnerability and poverty. SEI, IUCN, IISD, Intercooperation, http://iisd.org/pub;ications/publication.asp?pno=529.10/05/04.

Shuaibu, H, Abdullahi, A.A, Ango, A.K, Yusuf, H.A, Sulaiman, R & Bello, M. (2015). "Food Security and Coping Strategies of Selected Villages along River

Rima Affected By Flood in Sokoto State, Nigeria," *Asian Journal of Agricultural Extension, Economics & Sociology 6(2):77-84*

Tien, N. T. H., Tuan, P. A., Phoung, N.T.D., Leschen, W., (2005). Feeding Cities – Dong My, a peri-urban community in Ha Noi, Vietnam, involved in the cultivation of fish, Aquaculture news. Vol. 32, pp. 3 – 5.

Townsend, R. M. (1994), Risk and Insurance in Village India. Econometrica 62(3); 539 -591.

Udoh, A and Nyienakuna, M. (2008). Examining Socioeconomic Characteristics and Adoption Trend of Artisanal Fishers of Akwa Ibom State in West Africa.

Udoh, E.J. Akpan, S.B. and E. F. Uko. (2017). Assessment of Sustainable Livelihood Assets of Farming Households In Akwa Ibom State, Nigeria. *Journal of Sustainable Development; Vol. 10, No. 4; 2017 ISSN 1913-9063 E-ISSN 1913-9071 Published by Canadian Center of Science and Education.*

Udry, C. (1995), Risk and Saving in Northern Nigeria. The American Economic Review. 85(5): 1287 – 1300.

Van Brakel, M., Morales, E.J., Danai Turongruang and Little, D. C., (2003). Livelihood improving functions of Pond-based integrated Agriculture/Aquaculture Systems. December 2003.

World Bank (1996) Nigeria Poverty amid Plenty. The Challenge of Growth with Inclusion. A World Bank Poverty Assessment. Population and Human resources Division, West Africa Department, Africa region. Report No. 14733 UNI.

Ziervogel, G. A., Nyong, B. Osman, C. CConde, S. Corles and T. Downing (2006), Climate Variability and Change: Implications for Household Food Security. Published in Assessment of Impact and Adaptations to Climate Change; Series No. 20: 1- 25.